



CGCTCAGGATAGGACCTTCGCTAGAGATCGGATCCCGGAGGATATTATATAGCTCGATCGATC
 TTCTCTATATCTTCGGGATGGGATATATACACACACATCTCGGATAGCATGACTGATCTA
 CCCCCTCTCTTCGTCATACGTCT
 CACAGACTCTAGGCT

Nucleotide

PubMed	Nucleotide	Protein	Genome	Structure	PopSet	Taxonomy	OMIM	Book
Search: Nucleotide		for		Go		Clear		
Limits		Preview/Index		History		Clipboard		Details
Display	default	Save	Text	Add to Clipboard	Get Subsequence			

☐ 1: Z47352. M.musculus PRM1, ...[gi:1360004]

[Links](#)

LOCUS MPMRGN 13812 bp DNA linear ROD 11-DEC-1996
 DEFINITION M.musculus PRM1, PRM2, PRM3 and TNP1 genes.
 ACCESSION Z47352
 VERSION Z47352.1 GI:1360004
 KEYWORDS PRM1 gene; PRM2 gene; PRM3 gene; protamine; TNP2 gene; transition protein 2.
 SOURCE house mouse.
 ORGANISM Mus musculus
 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
 REFERENCE 1 (bases 1 to 13812)
 AUTHORS Schluter,G., Celik,A., Obata,R., Schlicker,M., Hofferbert,S., Schlung,A., Adham,I.M. and Engel,W.
 TITLE Sequence analysis of the conserved protamine gene cluster shows that it contains a fourth expressed gene
 JOURNAL Mol. Reprod. Dev. 43 (1), 1-6 (1996)
 MEDLINE 96341725
 REFERENCE 2 (bases 1 to 13812)
 AUTHORS Schlueter,G. and Engel,W.
 TITLE Genomic sequence of the mouse protamine gene cluster
 JOURNAL Unpublished
 REFERENCE 3
 AUTHORS Schlueter,G.
 TITLE Direct Submission
 JOURNAL Submitted (06-JAN-1995) Schlueter G., Institut fuer Humangenetik, Universitaet Goettingen, Gosslerstr.12d, Goettingen, germany, 37073
 REMARK Revised by [3]
 REFERENCE 4 (bases 1 to 13812)
 AUTHORS Schlueter,G.
 TITLE Direct Submission
 JOURNAL Submitted (30-MAY-1996) Schlueter G., Institut fuer Humangenetik, Universitaet Goettingen, Gosslerstr.12d, Goettingen, germany, 37073
 COMMENT On Jun 5, 1996 this sequence version replaced gi:886891.
 Related sequences: X07625, X07626, M60254.
 FEATURES
 source Location/Qualifiers
 1..13812
 /organism="Mus musculus"
 /strain="c129"
 /db_xref="taxon:10090"
 /chromosome="16"
 gene join(653..758,853..902)
 /gene="Prm1"
 CDS join(653..758,853..902)
 /gene="Prm1"
 /note="male germcell specific, haploid expressed; chromatin binding"
 /codon_start=1
 /product="protamine 1"
 /protein_id="CAA87410.1"
 /db_xref="GI:1360005"
 /db_xref="SWISS-PROT:P02319"
 /translation="MARYRCCRSKSRSRRCRRRRRRRCRRRRRRCCRRRRRRCCRRRRSY TIRCKKY"
 gene join(5389..5647,5753..5817)

CDS /gene="Prm2"
join(5389..5647,5753..5817)
/gene="Prm2"
/note="Description: male germcell specific, haploid
expressed; chromatin binding"
/codon_start=1
/product="protamine 2"
/protein_id="CAA87411.1"
/db_xref="GI:1360006"
/db_xref="SWISS-PROT:P07978"
/translation="MVRYRMRSPPSEGPQGPGQDHEREEQGQGGLSPERVEDYGRTH
RGHHHHRHRRCSRKRLHRIHKRRRSCRRRRRHSCRHRRRHRRGCRSSRRRRRCRCRKC
RRHHH"
gene 6498..6806
CDS /gene="Prm3"
6498..6806
/gene="Prm3"
/note="male germcell specific, haploid expressed"
/codon_start=1
/product="protamine 3"
/protein_id="CAA87412.1"
/db_xref="GI:1360007"
/db_xref="SWISS-PROT:Q62100"
/translation="MGSRC SKLSTGHEQPAQNTGHNRGHESSMKKLVACVSQDNFSL
SEEEEEEEDEEEEEEEEEEEEEEQIPVKGLLLLEPEKQESAEDGEAQPSPPEPKQTHS
"
gene join(8786..9122,9294..9310)
CDS /gene="Tnp2"
join(8786..9122,9294..9310)
/gene="Tnp2"
/note="male germcell specic, haploid expressed; chromatin
binding"
/codon_start=1
/product="transition protein 2"
/protein_id="CAA87413.1"
/db_xref="GI:1360008"
/db_xref="SWISS-PROT:P11378"
/translation="MDTKMQSLPTTHPHPHSSSRPQSHTSNQCNCQCTCSHHCRSCSQA
GHAGSSSSPSPGPPMKHPKPSVHSRHSPPARPSHRGSCPKNRKTFFEGKVS KRKAVRRRK
RTHRAKRRTSGRRYK"

BASE COUNT 3400 a 3514 c 3869 g 3029 t
ORIGIN

1	gtctagtaat	gtccaacacc	tccctcagtc	caaacactgc	tctgcatcca	tgtggctccc
61	atttatacct	gaagcacttg	atggggcctc	aatgttttac	tagagcccac	ccccctgcaa
121	ctctgagacc	ctctggattt	gtctgtcagt	gcctcactgg	ggcgttggat	aatttcttaa
181	aaggtcaagt	tccctcagca	gcatttcttg	agcagtctga	agatgtgtgc	tttcacagtt
241	acaaatccat	gtggctgttt	cacccacctg	cctggccttg	ggttatctat	caggacctag
301	cctagaagca	ggtgtgtggc	acttaacacc	taagctgagt	gactaactga	acactcaagt
361	ggatgccatc	tttgtcactt	cttgactgtg	acacaagcaa	ctcctgatgc	caaaagcctg
421	cccacccctc	tcatgcccat	atttggacat	ggtacaggtc	ctcactggcc	atggtctgtg
481	aggtcctggt	cctctttgac	ttcataattc	ctaggggcca	ctagtatcta	taagaggaag
541	aggggtgctg	ctcccaggcc	acagcccaca	aaattccacc	tgctcacagg	ttggctggct
601	cgaccaggt	ggtgtccctt	gctctgagcc	agctcccggc	caagccagca	ccatggccag
661	ataccgatgc	tgccgcagca	aaagcaggag	cagatgccgc	cgctgcaggc	gaagatgtcg
721	cagacggagg	aggcgatgct	gccggcggag	gaggcgaagt	aagtagaggg	ctgggctggg
781	ctgtgggggg	tgtgggggtg	gggacttggg	catgtctggg	agtccctctc	accacttttc
841	ttacctttct	aggatgctgc	cgctgcgcgc	gctcatacac	cataaggtgt	aaaaaatact
901	agatgcacag	aatagcaagt	ccatcaaaac	tctgcgtga	gaattttacc	agacttcaag
961	agcatctcgc	cacatcttga	aaaatgccac	cgctccgatga	aaaacaggag	cctgctaagg
1021	aacaatgccca	cctgtcaata	aatgttgaaa	actcatccca	ttcctgcctc	ttggctcctt
1081	ggcttggggg	gggggtgcgc	gatgtgggta	gggaacatga	ctgggtcaaat	gggaagggct
1141	tcaaaagaat	tcccaatatt	gactaccaag	ccacctgtac	agatcttgcc	ccagaaaggc
1201	ataggggaca	cgtgtctgag	ggcctctgtg	gcacaagggt	tttaccaatg	tcagagatga
1261	gggccccaac	caacaaatgt	cattctaact	cttgagatat	agggccacac	ctgattctct
1321	tggagaagct	gggtatggtg	gtttcaatgt	ttggccaggg	tgtggccttg	ttggaactgt
1381	ggggagcatc	ctccaagctg	cctgaggatg	ccagttcttc	gtctgccttc	agaacaagat
1441	gtagaacttt	cagctccttc	tccagtacca	attcggtctg	gatgatacca	tgcttctcac
1501	cataatggac	tgaacctttg	caactgtaag	ctagccccaa	tgaatgtttt	tgtttggagg
1561	aatatggatt	ttgggaattt	ggatttataa	aagcagtgga	atggtttaag	tgaggaataa

```
1621 caggccatcc tagtaggaat atggaagaat tcttttggt aagaatgact gctttttgcc
1681 tcgtctgaaa acctagagat attagttgaa ttgagaaagg aagcctcatg aagagcattt
1741 tgattgagca tagcaagctt agaaaagact aaaggggcac caggaagtaa agctgaatcc
1801 ttcattttaag gagataaaca caacaccaac ttttaaagtt ggagtgatat aggggttcagg
1861 gagtggcact attaggagggt gtgaccttgt tggaggaagt ctctcactgt ggggatgggt
1921 ttagagactc ctgactacct gaggatgcca ggacaagatc ccaccagct aaggttgttt
1981 gtgtttactt tcatctggat ttttaataca tttatgatcc agatcttgag actggaagac
2041 acagaccttt ttgatctaga tcttgaggaa tagtggccat gaagagttta ggtctacgaa
2101 tggtagtaca cacttttaat cccaggagac aggcaagcag atcactaagt cagcttggga
2161 cagagcaagt tcatggtgaa gaaaagcatg atctcttgag ttcaaggtca atgtccaaag
2221 caagttctag gacagtcaag cctaggcaat gagggatgca ataaaacaag gggccatgct
2281 tcaggcatgg ggctctggct ttagagtcaa gaataggcga ctactgcgac aatcaatgct
2341 ggttagcagg agctaagaaa ttaacggtga ttaagaagag accagcaca aaacctgtg
2401 tccagagata gccaaagtag tacctttgtg gtaagatatg tgtgtgatgc ctgggtttga
2461 aggcattgagg gagtcataga gagcagctga ggcttggcac tgtgagagac cagggaaggc
2521 cattgatgaa ggtgcagcct cagttgcaga tgatgggtcca ggactgaagg ggccatgctt
2581 ggcaaggtaa gacctggcac catgaaggga tcctatgaga ggctattggt gaagcctagt
2641 tgcagtggaa aatgttggga gatgccatca ccatgggatg atcaccaaga acagcagcag
2701 cagtgagtg gtgtcaacca gagcctacga tctagagga gctggagaaa tgaggagcct
2761 agaagattac acgtggatcc cagacactaa aacaagtaaa gttgaagttg ccttggagac
2821 ttcaacatgt tagagatgtc agagctctga ggtacctgct gaggaaagct gctaacatgg
2881 agtgccagat cagtttggag tttgtctagc tgggttttgg ttttgccttg gttatgacat
2941 tttggaatgg taatgtatat cctgtgatgt gggaggatg tgatctgctt cttgctttgt
3001 cattttaggg gaatcacagc taacagattg catgaatctt agaagagact ttggacattt
3061 aacttcggtg agactattat agactataga actttaccaa agattcatgt gtttgaacaa
3121 gcatatggga agccactatt agggagtggc actattagga ggtgtggcct ttttgaggga
3181 agtgtgtcac tgtggggatg ggttttagaga ctctcaggc aagatcccac ccagctatgg
3241 ttgtttgtgt ttacagttga acaaggttag atgttttcat ttggattttt aacctggaaa
3301 actttacaat ccagaaagggt aggatggagg gcacagacct ttttgatcta gatcttgagg
3361 aatagtgccc atgaagagct taggccacag catggttggt cacactttta atcccagaag
3421 acaaaggcaa gcagatctct aaattcaaa tcagcttggg acagagcaag ttcaaggtga
3481 agaaaagctt gagttcaagc ataatgctgg ttaacagtga ttaagagacc agcacaaaaa
3541 aatctaatac cttgtgtctac agctggactt ggtaatgtgt aagatatgtg tgtgttctg
3601 gttttgaagg catgaggagg tcatagagag cagctgaggc ttggcactgt gagagagcca
3661 aggccattga tgaagggtgca ggactgaagg ggccatgctt ggcaagggtga ggcctggcac
3721 catgaagaga tcctatgaga ggcctattgt gaagcctagt tgcagtggaa aaccccagca
3781 tgttggaaat gccatcccca tgacactaga acaagtaaaag ttgaagttgc tttggagatg
3841 acctattaga gatgtcagag ttctgaggta cctgctgagg aaccagccca agagaacgga
3901 gtttgttgc tctgaatgcc agctctgcca acagtaatca acaaggatga aaggtgttgg
3961 ggatcagttt ggagtttgtc tagctggttt tgggttgggt cagtattttt ttactatgat
4021 aatgtacatt ctgtgatgtg ggagatatgt gatctacttt ttgggtttgt ctttggacat
4081 ttaacattgt tgagactatt acagactata gagcttttga cccaaagatt catgtgtttg
4141 aacaagtata tggggtccag ggaggggcac tattaggagg tgtggccttg tgaggatgcc
4201 tgtgtcactg tggggatggg ttttagagact cctagctgcc tgaggatgcc acgcttccca
4261 tttcagctcc agcaccaagt cagcctggat gatgccacgt ttcccatcat aatggactaa
4321 acctctgaaa gtgtaagcca gccccaatta aatgtttgct cttataagag ttgccttggt
4381 cacgtgtatc ttcaatggag tgtccaagac agtgggggggt gtccaagatc ctgtggcctg
4441 cactgtgcct aagaactgga caagtgtgtt tcccactat agcccagtgg ccacagtaac
4501 aatcaaaact attattttcc agcaagagta gccatctact gtgtactctg cactctacca
4561 tagactgaaa ttactaggtt gtgctgttgt gcactttttg caactagttt agatcttatt
4621 taagctagca ctactaactg ctcatgttcc tgtgacaggc tcagattcaa gaattatgag
4681 ggactatgtc cctctgcccc actcccacac ccttctgatt ctggactatt catcagcaag
4741 gtagagttga gaatcaacaa atgtctcaga tatgcctcag gaaagtagag gtaggcagac
4801 ctggttagcc taagatccaa gataggaaat taagaagtta atctgtgcct
4861 cagtttcccc catgggaaga tatgttacac tgccttaat gcacatggag tgggtgggaa
4921 gcttttgcta ggagttgggt agtgcctctc tcgaatgcc aaccaaggcc atgcatgggc
4981 tgcattctca acactgcatg tccagggcat ggaagcacac atatgtgatt ccaacccctg
5041 ggaggtaaaag ggaccagggt tagaagttca aggtcattct tcattgtgtg aggccatctc
5101 acattcaata agtcagcatg cttcaaagca agatgagtaa cttggccctc aagcagctcc
5161 tgcaaaacct gtgccgccct cagagagggg actgggcagg gtgggaacaa tgaactcagg
5221 gtgggcccgc aggtcacagt ggggtttacc tttatatatg agccctctga gagcccaaaa
5281 caccagacca tcatcaccac caagagcagg tgggcaggct ttcgtccctc ctctccaat
5341 ccaggtcagc tgcagcctca atccagaacc tcctgatctc ctggcaccat ggttcgctac
5401 cgaatgagga gccccagtgga gggctcgcac caggggcctg gacaagacca tgaacgcgag
5461 ggcaggggac aggggcaagg gctgagccca gagcgctag aggactatgg gaggacacac
5521 aggggccacc accaccacag acacaggcgc tgctctcgta agaggctaca taggattcac
5581 aagaggcgct ggtcatgcag aaggcgagg agacactcct gccgccacag gagggcgcat
5641 cgcagaggta agcaccacac agccgacccc ctggccacct gtgctgctgc tgcccatcta
5701 aacctgctg ccttcaggc agcctagcaa acctcgactt tcctttctac aggctgcaga
```

5761 agatcccgaa ggaggaggag atgcagggtgc aggaaatgta ggaggcacca tcaactaagcc
5821 tccccaggcc tgtccattct gcctggagcc aaggaagtca cttgccaag gaatagtcac
5881 ctgcccagc aacatcatgt gaggccacac caccattcca tgtcgatgtc tgagccctga
5941 gctgccaaag agccacgaga tctgagtact gagcaaagcc acctgccaaa taaagcttga
6001 cacgagattc actgactgct gtctcctttt caacaacacc gtgggcctta ggggaaggggc
6061 ctgaggggaag gggcctgagg gaagggacta gggaaaacaa ggtccactcc tacagctact
6121 gtcaggaagt gacctgaacc atggatagaa ttggccaaat ccaagcatcc ttacggtgaa
6181 gtgtgaacta aaatgaagag ctggaatggg gtggggaggg ggtggggtgg catgggtgaa
6241 ctggactgag accatcttcc cagcacatga gttaacatgt tcagctcttc tagtttgtgc
6301 cctctccagc gtctactcta ccccaatcat tccagctcag ccagggttcc tggaaaatgt
6361 aagcatagct ccaaattctg ggggtgggga ggggtggtcc ttggagcctt tgtgaggtca
6421 gtgccacacc caccagtctc acactctctc gctaccagg ctgcctccct cctagtcag
6481 agagacagga gtggcgatg ggttcccgct gttccaagct cagcactggc catgaacagc
6541 cagcccagaa cactggctac aacgtggccc acgagtcctc catgaagaag ctccgtgcct
6601 gtgtgagtca agacaacttt tccctgtcat cagagggcga ggaagaggag gaggacgagg
6661 aagaggagga ggaggaagaa gaagaagagg aagaggagca aatcccgggtg aagggcaagc
6721 tgctgctgct ggagcccga aagcaagaga gcgccgagga tggggaggcc cagccaagcc
6781 ccgagcccaa gcagacacac tccctgagcca caaggcctgc ctggcaatgg gtgcccattg
6841 ccacgccaga ggacattcag aaaagaataa agagtctcca tggaaactctc ttggtctccc
6901 tctttccctt tatgtgcaac gtgtgtgtgt gtgtgtgtgt gtgtgtgtgt gtgtgtgtgt
6961 gtgtgtgaga gagagagaga gagagagaga atgcctcact gggggtgtctg tccaaggctg
7021 gatattgtttt gattcaggct ctatgtagca tccctctatgg aggatgtggc tatatgcagg
7081 gaagcccaga ggaaagtccc atctcctatt aactcctatt caaaagaaac agcagtatgt
7141 gggaggaagg aggcctctc agcccttggc tttcaccac cttgccactg agggctcttg
7201 ggatctggga agtgaacccc agtgaacctt taggagaggc aaggaacaca aaggtctcca
7261 agtgggtttg gggaagggtg atagggtctc aattcatgcc agagacccaa atatgtcttt
7321 cacgtgtggc cagttctccc atgggagctg cagaggcctc agggctggct gtgtagcaca
7381 agcacagagc ctgtgcctta ggtgtactgc cccaacaagg atctgcatgt ggggacagcc
7441 ctgggtgtag gtgccaccag ccactactcc tgaaactttg gacttatggc tacagcagcc
7501 cagcctgcac atcaaaccca gggccttgta catgccaggc agactcttgg gacagtgcct
7561 ctatcctctg tgagaatact tgcctagtga tgtgaaggcc tgcccaatta tagctctgca
7621 tgggtaccata attcttcaaa ggctctatct tggggagggg aagctaccat tcagcctgct
7681 aatatgggaa catcccagac aaagctggct gcaaagatga acagagaagg cagaactcat
7741 taaatcaggt agtttcacaa cggcatgttt atttaaaagt gaacttagaa ctggaatccc
7801 agaactctgg agaagattcg ttgagctgag accatctcag caggtaaagg aacatgttgt
7861 caagctgagt tcaaggagag aaaccactcc taagagttgt cttctgaaca cactcacaca
7921 tacacacagt gaatgtaag gccatgccca gtgaatcctg gctgcatggg tggtagaggg
7981 gaattcttca gaagtactga agtttgcca gggccatgtg ggcagcattg cctcctacaa
8041 gagtgtcaga gtgattacag gtggttctag taaaatacca cgacctgtgc ttttcaggc
8101 tgggtactaa agcaaagacc accaggactc aaagcatccc aggctgagaa tggggggggg
8161 ggtggtcatg taagactgag ggagcccatg ggatacccaa gatcaggctt cagttctgtg
8221 aactgaccc ttaacttccc agctgtctgg gccctaatac cctgaaagc ctttgtctta
8281 agatgctacc caatcagggc acagtgtctc gctaccacca cactggctat acttctata
8341 ataggccagg cactaggtgg ccgggtggaa aatggaactc tgcagctgtc ttgaggcctt
8401 caagcacagg ctacaggctg atcttttagt aacctcatga tataaatcct ctgttacttc
8461 tcctggcggt gatgtcaccg tgagaagggt acaattactt agttggagg actggagtag
8521 aaagaaggga cacacagagg tgaaccaaga aagctgcaga tctgagatgt gggctcagca
8581 caatctgacc tgaccacag gcccttaaaa gctgccccgc cctgggtgaa gactgagagg
8641 agggctttgt catacctgtc accctctgtg gcctatgcca tcataatcgg ccagctata
8701 taactagggg ctgtggggac tccccaaagc cgggcctgct gggaggagga ggaggaggaa
8761 gtctctgccc cgagtgtggc ctcccatgga caccaagatg cagagccttc ccaccactca
8821 tccccacccc cacagctcct cgcgccctca aagtacaccc agtaaccagt gcaatcagtg
8881 caccctgcag caccactgcc ggagctgcag ccaggcaggc cacgcgggct ctagctccag
8941 ccccagccct ggcccgccca tgaagcacc caagccatcc gtgcactctc gacactcacc
9001 tgcaagaccc agccaccgag ggagctgccc caagaacagg aagacctttg aagggaaagt
9061 gagcaagaga aaggccgtca ggaggcgga acggactcac agagctaaga ggcgtacgtc
9121 aggtacctgc agggcaagcg gggacaagg aacactgcaa ggctgccag gcggtcatgg
9181 cttacctgag caacacgcac tcaattgctt tccagatgga gtggaatgga ctggggggag
9241 tggaggggga gcagacagg attaaaggct ctttttccat tccctgtctt tagggcgaag
9301 atacaagtgga cgcactccag gatgttctct gtgtccattt atcccaaaat gagatagcca
9361 tcaactaggg actgttggga tgatgtcaca ggaacatgtc actgcagcaa tttctatgca
9421 acatggatta aagcttgtac cctggaagac tagtcttgag tcagcagctt ttaaaaaaa
9481 aaaaaaacia aaacaaaaaa aaaatgtttg tgtacactgt cgtgtctcc agacacacca
9541 ggagagggga tcagattcca ttacagtagg ctgtgagcca ccatgtggtt gctaggaatt
9601 gaactgcaga cctctggtag agccgtcagt gcttttaacc gcccgccat cctccagcc
9661 tgagtacgca gttttaattt ttttaataaa agcattecta tccacaagg atgcttgac
9721 gcaagtgtac acagcagaca tgacagcaag gcaacattgc ttggctaacy gaccaagttc
9781 agggaaactga acttcccaga gctttcccag aagtgggaca ggctatctac ctcaccgcac
9841 aatctcccag tccctccctc tcccatctgc gttgacactt tcaaaatcac acaggggag

9901 tgggcagtac ttcccagcag gacactgtga atgctggaaa aaggtggcct gcaggctagg
9961 ctatggaaacc acgtttggca tccaagcctg caggacccta caatggcagc cactgtacag
10021 tgggtactgg gctctctgga cccctggggg tgggtcagga agcagctata cagctcagca
10081 tgtttctttt tcacaacttt tagaaactga aaccaagtgt tccaaagaca gcttgacttg
10141 ccctgtactt tagatggaag gaaggcaatc agatccctgg catatatact aaagactgca
10201 tcaactggaat gtgatggatg ggagagggct agccaggggc agggcgagag gacacacct
10261 ctgactgagg aggaggggag atttctctgag agcaggcaga ggtggaggcc tggagtctc
10321 tattttatagg gttcttctga aaaggtctgc caagagcttg gcagggagcc aggcctgcag
10381 gagccagccc agccttgtca cccacctcag caccaataag cctgccaggt cccaagggga
10441 tactgtaccc caagaggttt tcctcacttt gctgggctg gaagcacagt ttggggatgg
10501 agttcaccaa cccagttact actaaaatag gctggtacaa ggccctgtgt ttagtcccc
10561 gcactgcaaa caagcatccg tgatgcttgc cagaccagaa agacctgaag gccagtctag
10621 gctgagacgc gctagaggga ggcagtgcta caaaccagc ctttatcgcc caccaagggt
10681 tagactgacc atggctgcac cacaaccaca gccacacaaa tcaagcacc acaagataag
10741 tttggttgtg cttaggatga aatatggcgc tctgtgctct gtctggggag accaggactt
10801 ggctcagag cttcagagga gccgcctgac agctaacaga gaaacctgta gagggcagtg
10861 tgcgtcactg tgagcacagg gaagcctgca cgcgaacctc atccgccttc attcataaac
10921 atcgtcagcc aggcacccac tcctggcctt tcaggacaaa ctgaatcacg aaaccacaca
10981 gtgtcctaag gataggtctg actgcttggg tccaaagcca aggtgtgctc gggggccctt
11041 gtacaggcag atgcttgctg gactcttgac caaaagtttg gggattacag ctttttttgg
11101 aatcacagcc ccgcccgggg cctcagtttc tccggctgcc cacgtagtaa gagtgcagag
11161 agtgagtcca ggcccctggg aaccagccc aaccgcgcc ggtttccgag gaactaggcc
11221 gggagcgggg gcgcccctcc cgcaccgct taggcttctt ttgaagcctc tgcggtcagg
11281 ccaccgcttc ctgggaagcc caagccaagg ccaggccgaa tggccaacgg gaggggccc
11341 cagcgggttc tggaggaggc cggcgccccc acaggtctct aggactagct agccgggttc
11401 caagaagggt cgagattgcc aaggcctcgg ggtcctgggc aggaaggacc ctcagggga
11461 ggagctgctt ggggagcaca ggggtccaggc gaggcggagc cctaaccaga agaatgcaga
11521 caccggagg ggaggaggcg tgtcagcccc gcgctagcat cccacacggc gggctgcgat
11581 ttggggcgaa ggttagagcaa aagagcgggc accaagtcct aagcacccca ggcacggaac
11641 acaagattcc ggttggagcc ggaaccccag aggtcccaat gtgggaaggt gcgaggcgaa
11701 accaagttag aggaaccgtc tccagggaga gcctcaggag tctagagaga acccgaaaga
11761 cttgcccggg agagaaaccg aaagcggggg tgggctggac ctgtggggcg ggcctgctg
11821 gtttaagagc ctgatgcagg ggcgggcagc agcagagaga actgcgccg tggcagcggc
11881 acggctocca gccccggagc atgcgcgaca gccgccccgg agccccagc cgcggctccc
11941 cgcgtcctgc cgccagggtga gccaaaggcag ctgcgaggga gcaggcggga ggggatggga
12001 ggtgatggga gcagagcccc gcaggactaa cctcgcagac tgtatggcag ggtcgaggat
12061 tccgcgcccc ccaccccccc cccggctccc ccaggaggcc cctcgctcga
12121 gcggggcgcc gtcagccctt cctctccggc cctgagccct gatcctccgc ccgggttcca
12181 gtccccggcg tggccagtag gcggcagccg cgaggcgact agccaccagc ggggacggcc
12241 gggagtcggg cccctctcca cgcccccttc tccacgcgcg cggggaggca gggctccacc
12301 gccagtctgg aagggttccg catacaggaa cggcctactt cgcagatgag cccaccgagg
12361 ctcaagctcc gggcggtatc tgcgtgccgc tctcgtcctt tggggtctgt tggcggcct
12421 gtgccaccgc gacgcccggc tcactgcctc tgtctcccc atcagcgcac ccccgacgc
12481 tatggcccac cctccagct ggccccctga gtaggatggt agcacgcaac caggtggcag
12541 ccgacaatgc gatctcccc gcagcagagc cccgacggcg gtcagagccc tctcgtcct
12601 cgtcttcgtc ctgcgcagcg gcccccgctg gtccccggcc ctgcccgggg gtcccagccc
12661 cagcccctgg cgacactcac ttccgcacct tccgctccca ctccgattac cggcgcatca
12721 cgcggaccag cgcgctcctg gacgctcgcg gcttctattg gggaccctg agcgtgcacg
12781 gggcgcacga gcggctgcgt gccagccccg tgggcacctt cttggtgcgc gacagtccgc
12841 aacggaaactg cttcttcgcg ctcagcgtga agatggcttc gggccccagc agcatccgcg
12901 tgcacttcca ggccggccgc ttccacttgg acggcaaccg cgagaccttc gactgccttt
12961 tcgagctgct ggagcactac gtggcgggcg cgcgcgcgat gttggggggc ccgctgcgcc
13021 agcgccgcgt gcggccgctg caggagctgt gtcgccagcg catcgtggcc gccgtgggtc
13081 gcgagaacct ggcgcgcatc cctcttaacc cggtaactcg tgactacctc agttccttcc
13141 ccttccagat ctgaccggct gccgctgtgc cgcagcatta agtggggcg ccttattatt
13201 tcttattatt aattattatt atttttctgg aaccacgtgg gagccctccc cgctgggtc
13261 ggagggagtg gttgtggagg gtgagatgcc tccacttct ggctggagac ctcacccac
13321 ctctcagggg tgggggtgct cccctcctgg tgcctccctc gggctcccc tggttgtagc
13381 agcttgtgtc tggggccagg acctgaattc cactcctacc tctccatgtt tacatattcc
13441 cagtatcttt gcacaaacca ggggtcgggg aggtctctg gcttcatttt tctgctgtgc
13501 agaatacctc attttatatt ttacagcca gtttaggtaa taaactttat tatgaaagt
13561 tttttttaa agaaacaaag attcctagag cgtatgcttt ggccaaacgt cctgggttgg
13621 gagtggggta tacagactga cttttcttga agtcttcggg atgctggggg gaggggggag
13681 ggtcggacat catatacatc tccaccaca gtgatgggga ccaaacttcc aggtagttg
13741 tggtttatga ctgggaagat ggcgctcct gagtatccgt gctggtctc tggatttct
13801 gtgatgggat cc

//